

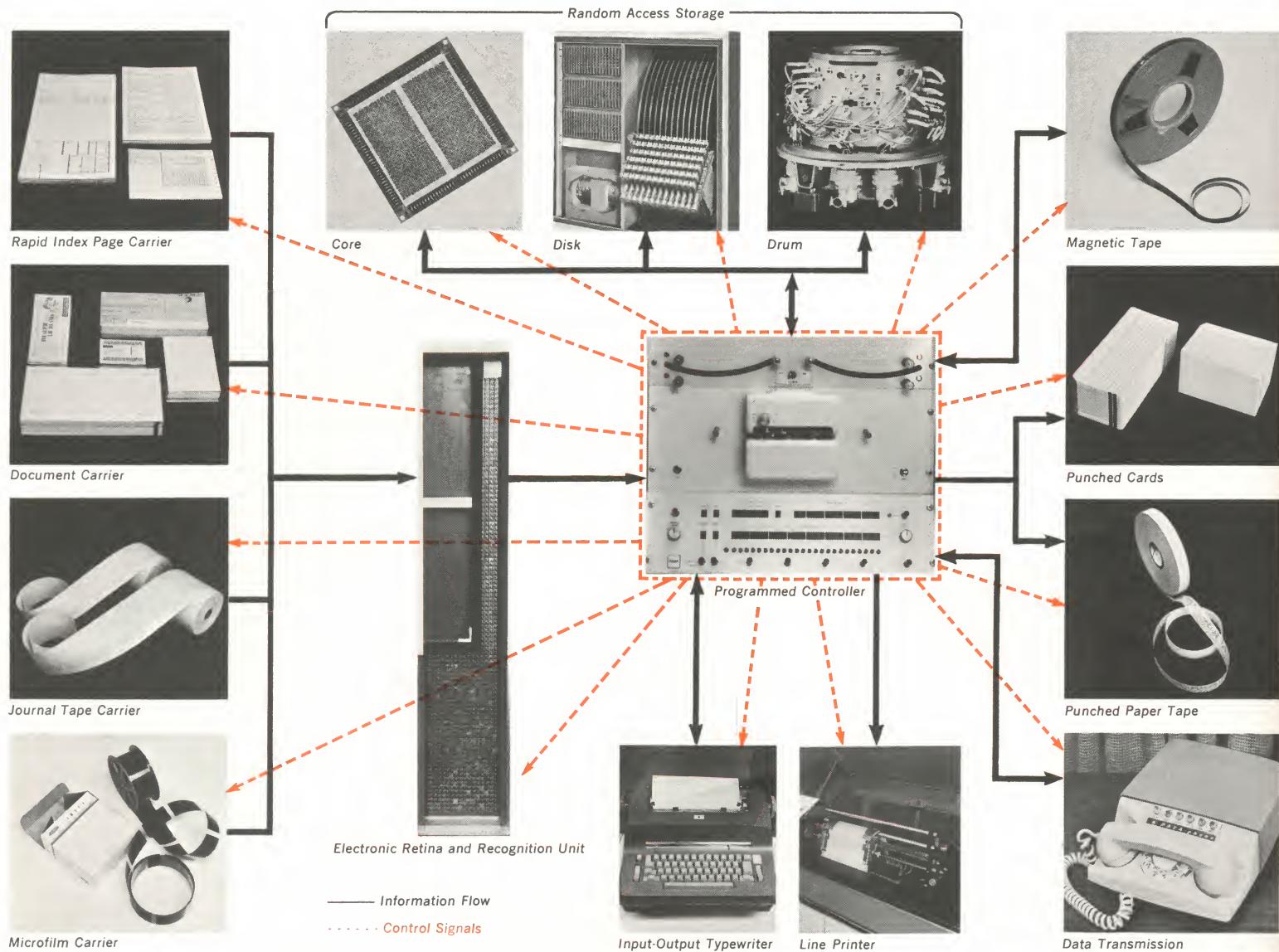
# RECOGNITION EQUIPMENT

*Incorporated  
Dallas, Texas*



# Now – ELECTRONIC RETINA\* COMPUTING READER

- Feeds your present computer more efficiently through source data automation
- Reduces current input costs
- Increases employee productivity
- Computes while reading to detect human errors earlier
- Cuts delays by eliminating key punching
- Extracts added management data without extra keystroking
- Improves utilization of present computer investment



## FIVE DIMENSIONS OF MODULARITY

Permit user to install only the equipment to process identified work load.

### 1. By Document Style

- Rapid Index Page Carrier for pages
- Document Carrier for unit records
- Journal Tape Carrier for adding machine and cash register tapes
- Microfilm Carrier for filmed data
- Any two document handlers accommodated

### 2. By Number and Styles of Type

- Ordinary styles of printing
- Intermixed multiple type styles
- Type style selection by stored program control
- Additional plug-in character vocabulary

### 3. By Output Media

- Magnetic tape
- Punched cards
- Punched paper tape
- Wire transmission
- High-speed printout

### 4. By Data Editing Capability

- Up to 128,000 characters of core storage
- Processing at 1.75 microseconds word cycle time
- On-line random access storage
- Extra magnetic tape drives for file maintenance

### 5. By User's Reliability Requirements

- Low cost subsystem redundancy
- Complete duplicate system backup unnecessary



## RAPID INDEX PAGE CARRIER SYSTEM

General purpose, program-controlled page reader

- Up to 2400 characters per second
- Page widths — 4  $\frac{7}{8}$ " to 14"; heights — 3  $\frac{1}{4}$ " to 14"
- Intermixed paper sizes and weights

- Real time program control:
  - Marks line on page
  - Defines data format
  - Separates selected pages
  - Rereads line
  - Balances input data to accounting controls

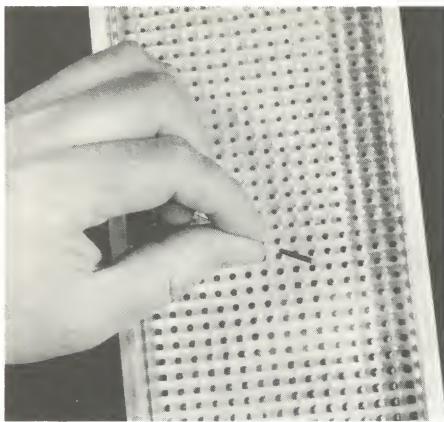


## DOCUMENT CARRIER SYSTEM

General-purpose, program-controlled unit record reader

- Two full lines read from document
- Up to 1800 documents per minute
- Document widths — 2" to 8  $\frac{3}{4}$ "; heights — 2" to 5"
- Document weights — flimsy paper to card stock intermixed
- Document stackers in modules of 3 (21 stackers maximum)
- Sorting, collating, code printing, and code reading available

- Real time program control:
  - Operates paper handler
  - Marks documents
  - Defines format
  - Selects output stacker
  - Segregates out-of-balance batches



### ELECTRONIC RETINA\*

Reads like the human eye. Complete character image is projected on Retina at one time. Unique three-dimensional approach bases recognition on height, width, and gray shades of character. Table at right shows how the Electronic Retina solves character recognition problems —

**Line Finder**—Location and tracking information for the next line is obtained while reading current line. This is accomplished by an extension of the Electronic Retina consisting of a column of light sensors.

**Vertical Analyzer**—The Electronic Retina is three times as tall as the character focused upon it. The Vertical Analyzer computes and switches that portion of the Retina containing the character. This handles character misplacement up to one full character height.

**Amplitude Correlator**—Each Retina cell assumes the characteristic of the sum of a

#### Character

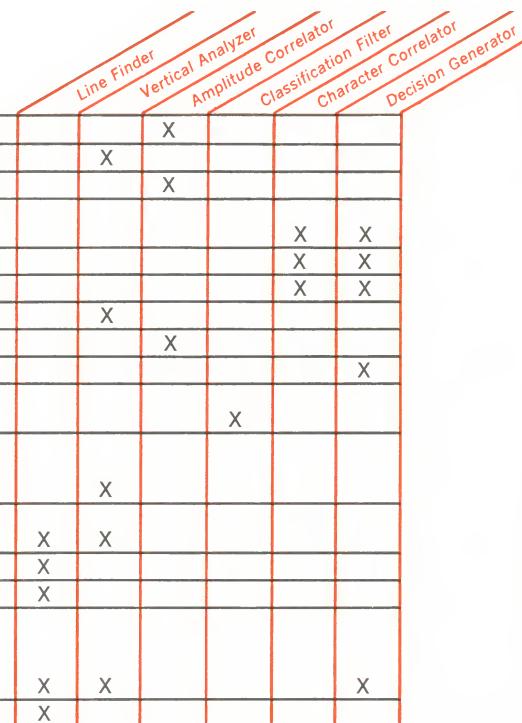
Smudges		X				
Misregistration (vertical)			X			
Stroke intensity variation				X		
Stroke integrity					X	X
• voids (missing elements in stroke)					X	X
• extraneous marks (ink and paper defects)						
Touching characters					X	X
Skew	X					
Contrast to background			X			
Pitch						X
Small area differences in character pattern (e. g., Q and O)					X	

#### Lines

Skew		X				
Locations			X	X		
• printing tolerances			X			
• reader tolerance				X		
Density (e. g., single spacing)		X				

#### Pages

Size variation		X	X			
• paper shrinkage — humidity						X
• accurate page positioning	X					



number of adjacent cells. This provides video clean-up of the character stroke by a process analogous to the human recognition method.

**Classification Filter**—This portion of the Recognition Unit emphasizes small differences in similar characters. It utilizes size and shape information to discriminate for character identification and minimizes the possibility of character substitution.

**Character Correlator**—This section of the system compares the three-dimensional character information present on the Electronic Retina against the equivalent

three-dimensional information stored in the machine's character vocabulary.

**Decision Generator**—These logical circuits identify the character present on the Retina. Two different criteria are employed:

### RAPID INDEX PAGE CARRIER

Page in fixed position on moving platform while reading

- Provides simultaneous page feeding, reading, and stacking
- Aligns pages automatically
- Eliminates jams in reading station
- Minimizes time "lost" by paper handling problems
- Stacks pages in input sequence



### DOCUMENT CARRIER

Air and vacuum technology for document handling

- Accepts intermixed paper weights and sizes
- Handles documents with staples, clips, tears, and stickers
- Accommodates folds and dog-ears
- Transports and sorts low-cost carbon backed paper
- Minimizes paper jams and prevents document mutilation
- Exposes paper transport for visibility and ready access
- Avoids static electricity problems
- Permits fast, reliable selection of read areas

## PROGRAMMED CONTROLLER

High-speed, low-cost, general-purpose computer for real-time control of character recognition and paper handling plus on-line data processing.

- Minimizes programming cost through available programming systems
- Provides for on-line restart after any interruptions in operation
- Computes while document is being read
- Stores and formats data to write magnetic tape
- Prepares magnetic tape compatible in code and density with your computer
- Performs editing, accumulating, balancing, check-digit verifying, and parity checking
- Controls sorting and collating of documents
- Permits paper handler and output units to operate simultaneously
- Accommodates growth with larger, higher speed compatible modules
- Allows unlimited reading format flexibility



## PRIORITY INTERRUPTS FOR PROGRAM CONTROL

Priority interrupts are generated during reading to activate stored instructions from the Programmed Controller. These instructions enable the Programmed Controller to track reading position, identify information read, and control system operation. System control is based upon location and performance information plus data content of paper.

Examples of Priority Interrupt assignments are:

- Begin page
- End page
- Begin line
- Line complete
- Program count complete
- Valid character
- Character reject
- Space recognized
- Vertical line recognized

## STORED INSTRUCTIONS FOR READER CONTROL

Through use of stored programs, the Programmed Controller directs the Reader continuously. It acquires the needed data while the document is being processed. The user's application program is assembled automatically into Recognition Equipment's Executive Program which generates the real time commands.

Examples from the repertoire of commands sent by the Programmed Controller to the Electronic Retina and Paper Handler are:

<input type="checkbox"/> Start feeding	<input type="checkbox"/> Inhibit alphabetic
<input type="checkbox"/> Stop feeding	<input type="checkbox"/> Inhibit numeric
<input type="checkbox"/> Reread	<input type="checkbox"/> Inhibit symbols
<input type="checkbox"/> Mark line	<input type="checkbox"/> Allow alphabetic
<input type="checkbox"/> Stacker 1	<input type="checkbox"/> Allow numeric
<input type="checkbox"/> Stacker 2	<input type="checkbox"/> Allow symbols
<input type="checkbox"/> Blind scan vertical	<input type="checkbox"/> All fonts on
<input type="checkbox"/> Blind scan horizontal	<input type="checkbox"/> Font "X" off

Recognition Equipment's program library includes these instructions.

## PROGRAMMING SYSTEMS

Extensive programming systems are provided to reduce the amount of applications programming done by the user. Existing software permits simple, rapid re-entry of rejects and corrections. All popular data field "edits" are available as subroutines. A special programming package enables direct substitution of typing for key punching.

Example programs and routines:

- Executive Program (a real-time program)
- Literal Assembly Program (language assembler)
- Report Generator
- Sort/Merge
- FORTRAN II Compiler
- META-SYMBOL
- Keypunch Simulator
- Key Verification Simulator
- Program Operating Procedures (subroutines)
  - General area filler
  - Edit and justify
  - One-to-four MAP
  - Edit numeric
  - Edit alphabetic
  - Check digit verification

## GENERAL

- Systems, forms design, and programming classes are conducted regularly for customer personnel.
- A full-time systems engineer is on-site with each system to perform preventive maintenance and assist in programming and forms design.
- Equipment is available on a service bureau basis.
- Selection of contract terms:
  - Purchase
  - Different lease durations
  - Purchase options in lease

For additional information write or call collect:



**RECOGNITION EQUIPMENT** Incorporated

Ross at Prairie Avenue, Dallas 4, Texas • 214 — TAylor 3-8194



Ross at Prairie Avenue, Dallas 4, Texas · TAylor 3-8194  
Cable Address: RECOGEQUIP      Telex: 073-2342

September 12, 1966

Mr. T. Nelson  
Systems Consultant  
Box 1546  
Pooghkeepsie,  
New York 12603

Dear Mr. Nelson:

Thank you for your interest in our Electronic Retina Computing Reader.

Enclosed is a brochure that describes this system and its operation. The Electronic Retina Computing Reader is the first production optical character recognition system with the broad, general-purpose capabilities to meet the requirements of the sophisticated, high-volume user of data processing equipment.

This system, which typically sells for \$475,000 to \$600,000 or leases for \$14,000 to \$16,000 per month, is performing profitably in a wide range of applications.

If you would like additional information, please contact the appropriate regional office listed below.

Sincerely,

*Ed Wattenbarger*

Ed Wattenbarger, Director  
Business Communications

pm

Enclosure

WESTERN REGION  
Tom Dunncliffe  
Regional Sales Manager  
1101 South Crenshaw Street  
Los Angeles, California 90019  
(213) 933-9585

MIDWESTERN REGION  
Robert Montgomery  
Regional Sales Manager  
188 West Randolph Street  
Chicago, Illinois 60601  
(312) 346-9533

SOUTHERN REGION  
Jack Meredith  
Regional Sales Manager  
4703 Ross Avenue  
Dallas, Texas 75204  
(214) 823-8194

EASTERN REGION  
John Arnold  
Regional Sales Manager  
815 Connecticut Avenue, N.W.  
Washington, D.C. 20006  
(202) 659-2542

FEDERAL REGION  
John Hoyle  
Manager  
815 Connecticut Avenue, N.W.  
Washington, D.C. 20006  
(202) 659-2542

1/19/19 | 3 | .35  
99Z | 90998 | 910.33

SHRDLU ETADIN PHINK  
SHRDLU BESSIE LOUISE  
STORM TEMPEST

### HIGH SCHOOL SUBJECT ELECTIONS

PUBLIC SCHOOLS

THILLIN SUSAN ELIZABETH

314 09 2 00 12  
PRESENT DIVISION GRADE SEX STATUS

SCHOOL ADMINISTRATOR

MARK "OPTION" POSITION ONLY IF REQUESTS ARE TO BE TYPED.

### STATUS CARD

RM 000 GR 07 SE 00

STANCE

IMPTON DL

ZONE 13 SEX-F

7/51 BV-11251693710

CHICAGO ILL

JEWELL E MOTHER

JEWELL MOTHER

09/09/64 000 07 00

NAME: LEMOYNE  
ID: 00186473 4440

PUBLIC SCHOOLS

HADED AREAS

JECT SUBJECT

110 93 800

VALIDATED  
HERE

76 12-07

POTAWATOMIE A

00999 89999 A ZZZ999

TEST12345678 123456789

I hereby acknowledge that at the time I described herein and certify that the contents of such ticket, was prepared

and that such ticket, and so used in accordance with applicable tariffs.

X

DEPARTURE OR DESTINATION OR HOLDER OF THE TICKET

PASSENGER NAME: NOT TRANSFERABLE

DESTINATION

VALID UNTIL

TICKET  
CLASSIFICATION

DATE AND PLACE OF PURCHASE OR

NOT GOOD FOR PASSAGE

FARE BASIS CARRIER FLIGHT DATE TIME STATUS ALLOW

SAN FRANCISCO RJO UA

TO

PASSENGER TICKET  
AND BAGGAGE CHECK  
TRANSPORTATION RECEIPT

DATE OF ISSUE

11 11 64

FARE BASIS CARRIER FLIGHT DATE TIME STATUS ALLOW

016:31

ARRIVED AT DESTINATION

DATE OF PAYMENT

016:31

CONJUNCTION FARES

016:31

FORM OF PAYMENT

103 1

RT  C CHANGE OF ADDRESS  
AND OR ADDRESSEE

E CHANGE OF ALLOCTEE CO-  
OWNER OR BENEFICIARY NAME

G CHANGE OF S. W. S NAME  
OR SERVICE NUMBER

I OTHER

P  D CHANGE OF MONEY AMOUNT

F CHANGE OF DESIGNATION:  
CO-OWNER TO BENEFICIARY OR  
BENEFICIARY TO CO-OWNER

H CHANGE OF CLASS  
(E TO Q OR Q TO F ONLY)

ION AND MILITARY ADDRESS

RD, BAT UNIT, FT HARRISON, IND.

2. END DATE OR Curr ENL DATE

3. SOUNDEX

MRER'S NAME (LAST, FIRST, MI)

JOHN P.

5. GRADE

E1

6. PREFIX

US

SERVICE NUMBER

98765438

8. AMOUNT

\$ 20.00

OTTEE, CO-OWNER OR BENEFICIARY

FIRST FEDERAL

40 IS TO BE MAILED TO ADDRESSEE

41 IS TO BE MAILED TO BENEFICIARY

HECK MAILED "IN CARE OF" OR  
"C. O. D." OR "C. O. D. FOR CHILDREN" OR "FOR A SP

ID OWNER'S NAME (FIRST, M. I. LAST)

42 USE OF ALLOCATION CLASS

SAVINGS

9. EFF DATE

10. CARRIER

11. COUNTRY

12. STATE

13. CITY

14. ZIP CODE

11 04-138-041

L 6106510 JP

PREMIUM ENTRY FORM AUSTRIA

15. STATE

16. CITY

17. ZIP CODE

18. STATE

19. CITY

20. ZIP CODE

21. STATE

22. CITY

23. ZIP CODE

24. STATE

25. CITY

26. ZIP CODE

27. STATE

28. CITY

29. ZIP CODE

30. STATE

31. CITY

32. ZIP CODE

33. STATE

34. CITY

35. ZIP CODE

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

0

0

0

0

0

0

0

0

0

RESERVE OIL & GAS

9-1-63

9-1-64

9-1-63

1010000

00000

0

0

0

0

0

0

MAILING OFFICE ONLY		NAME CALCULATION	016:300:010:103
		AIRLINE	POSTAL
		U.S. AIR MAIL REG.	
		 	

PLEASE READ INSTRUCTIONS ON EACH SIDE  
**VALIDATED HERE**

DEPARTMENT OF REVENUE MOTOR VEHICLE DIV.			
LOGAN		A	
00999	89999	A	ZZZ999
TEST12345678		123456789	

## REGISTRATION FORM

## PUBLIC SCHOOLS

BLAINE ELEMENTARY			UNIT 2300
STUDENT ID# 019951	STUDENT NAME (Last, First, Middle) GUY MARY ELLEN	GRADE/TELE 032454	ADDRESS (CITY STATE) CHICAGO
		UNIT X	

### NEW LOAN/RECORD CHANGE DATA

<b>LOS ANGELES</b>				<b>SAN FRANCISCO</b>			
EITHER DIRECTION							
<i>Via</i>		AIR LINES, INC.					
<b>EXCESS BAGGAGE TICKET</b>							
EXCESS WEIGHT (LBS.) FROM:							
1	11	21	31	41 OR MORE			
THRU	THRU	THRU	THRU	FIRST 40 LBS. \$2.00			
10	20	30	40	LBS. @ \$0.07 PER LB.			
TOTAL CHARGES (INDICATED)							
\$ .50	\$ 1.00	\$ 1.50	\$ 2.00	TOTAL CHARGE			
AUDITOR'S COUPON							
FORM OF PAYMENT							